

WHAT IS CLAIMED IS:

1. An X-ray imaging device, comprising:

an imaging portion arranged corresponding to a surface of X-ray incidence, having sensitivity to X-ray with a predetermined energy range and to visible light with a predetermined wavelength range and picking up images of X-ray and visible light; and

a scintillator arranged on an opposite surface to said surface of X-ray incidence across said imaging portion in a direction of X-ray incidence, emitting visible light with said predetermined wavelength range by absorbing X-ray with a higher energy range than said predetermined energy range.

2. The X-ray imaging device according to claim 1, wherein

said imaging portion is formed on said opposite surface to said surface of X-ray incidence on a semiconductor substrate; and

said scintillator is arranged on said opposite surface of said semiconductor substrate so as to cover at least said imaging portion.

3. The X-ray imaging device according to claim 2, wherein

said semiconductor substrate is thinned at

an area corresponding to said imaging portion.

4. The X-ray imaging device according to claim 1, wherein

5       said imaging portion is formed on said surface of X-ray incidence on a semiconductor substrate; and

10       said scintillator is arranged on said opposite surface to said surface of X-ray incidence on said semiconductor substrate so as to cover at least an area corresponding to said imaging portion.

5. The X-ray imaging device according to claim 4, wherein

15       said semiconductor substrate is thinned at an area corresponding to said imaging portion.

6. The X-ray imaging device according to claim 1, wherein

      said imaging portion includes a plurality of imaging elements arrayed two-dimensionally.

20       7. The X-ray imaging device according to claim 1, wherein

      said scintillator contains  $\text{Bi}_4\text{Ge}_3\text{O}_{12}$ .

8. The X-ray imaging device according to claim 1, wherein

25       said scintillator contains CsI.

9. The X-ray imaging device according to claim

1, wherein

said scintillator contains  $\text{Gd}_2\text{O}_2\text{S}$ .

10. The X-ray imaging device according to claim 1, wherein

5 a reflective film to reflect visible light with said predetermined wavelength range is provided behind said scintillator in the direction of X-ray incident.

11. An X-ray imaging device, comprising:

10 an imaging portion formed on an opposite surface to a surface of X-ray incidence on a semiconductor substrate, having sensitivity to X-ray with a predetermined energy range and to visible light with a predetermined wavelength range and picking up images of X-ray and visible light; and

15 a scintillator arranged on the opposite surface of said semiconductor substrate so as to cover said imaging portion, emitting visible light with said predetermined wavelength range by absorbing X-ray with a higher energy range than said energy range.

12. An X-ray imaging device, comprising:

25 an imaging portion formed on a surface of X-ray incidence on a semiconductor substrate, having sensitivity to X-ray with a predetermined energy

range and to visible light with a predetermined wavelength range and picking up images of said X-ray and said visible light; and

5 a scintillator arranged on an opposite surface to said surface of X-ray incidence on said semiconductor substrate so as to cover at least an area corresponding to said imaging portion, emitting visible light with said predetermined wavelength range by absorbing X-ray with a higher  
10 energy range than said predetermined energy range.